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Citizens' Bulletin

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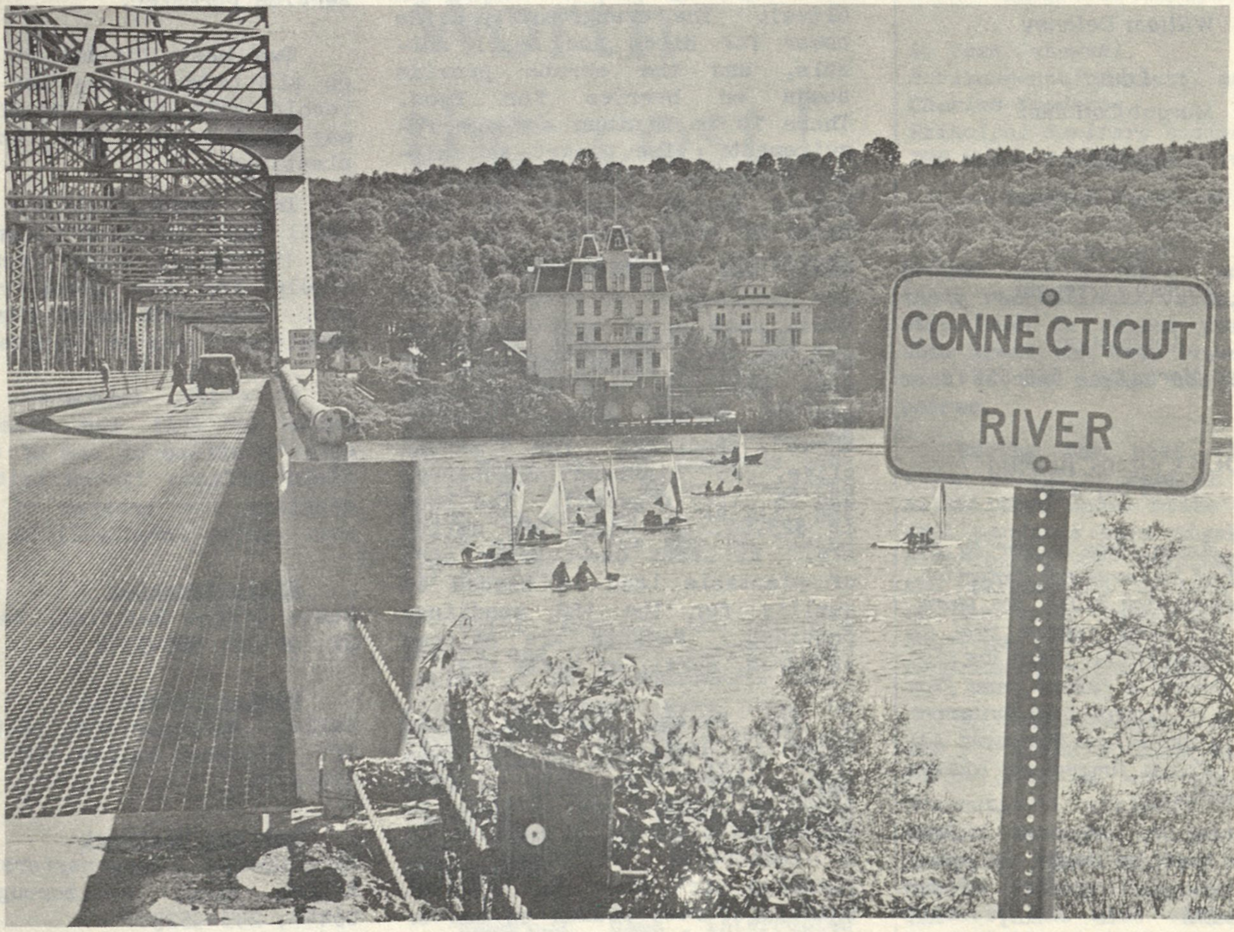

Worth the cost!

Citizens' Bulletin
October 1982
Volume 10 Number 2 $5/yr.
Cover Photo: Boating on Connecticut River at East Haddam: Dominick J. Ruggiero, Dept. of Economic Development

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State selling seedlings

Again this year, Connecticut landowners can purchase tree and shrub seedlings for reforestation, wildlife habitat improvement, Christmas tree planting, erosion control, or other conservation purposes.

"Orders should be placed as soon as possible," says Robert L. Garrepy, State Forester, "since many species sell out very quickly." Seedlings are offered under three programs: the "Buffer Bunch," "Wildlife and Conservation Packet," and "Forest Planting Stock."

The Buffer Bunch packet consists of 20 tree seedlings (10 white pine and 10 Norway spruce) and 30 shrub seedlings (usually 15 silky dogwood and 15 autumn olive). The evergreens provide cover for birds and small animals, and the shrubs provide seeds or berries for food. There is no minimum acreage requirement. The packet is shipped directly to the landowner by United Parcel Service in late March or early April. Its cost is $12.00, including shipping.

The Wildlife and Conservation Seedling Packet contains 75 tree seedlings (50 white pine and 25 Norway spruce) and 75 shrub seedlings (25 autumn olive, 25 highbush cranberry, and 25 silky dogwood). The cost is $23.00, including UPS delivery. At least one-quarter acre of plantable land is needed to qualify for the 150 seedlings provided. Packets are shipped in March, April, or early May.

The Forest Planting Stock offer is available to Connecticut landowners with larger planting areas, who intend to establish a forest plantation or a commercial Christmas tree planting or wish to augment existing forest stands on one or more acres (not including house lot). In some cases, federal cost-sharing may be available to offset planting expenses.

Forest Planting Stock orders for conifer species must be in multiples of 250, and the cost is $50 per 1,000 trees. These seedlings will be shipped to one of 10 delivery points in the State in April or May, and the landowner will be notified by postcard when the order may be picked up.

"While most people consider fields and other open spaces as logical planting sites," Garrepy says, "it is estimated that nearly 100,000 acres of existing forest land in the State would benefit from underplanting of various species of conifers. Areas recently logged or locations where gypsy moth defoliation has led to hardwood tree mortality are excellent loations for conifer plantings."

Orders for Wildlife and Conservation packets and Forest Planting Stock require the approval of a wildlife biologist, District Conservationist, or service forester.

Two restrictions are placed on all orders: They may not be resold with roots attached nor may they be used for ornamental plantings.

The seedlings are quite small when received (from eight to 15 inches high) and grow slowly for the first year or two. Then more rapid growth and development can be expected.

To order, landowners should write or call the State Forester's office or one of the DEP field offices listed below, indicating the program of interest. Order forms will be sent.

State Forester
State Office Building, Hartford, CT 06106; 566-5348

Western District
Valley Headquarters, P.O. Box 161, Pleasant Valley, CT 06063; 379-0771

Eastern District
Marlborough Headquarters, 209 Hebron Road, Marlborough, CT 06447; 295-9523

State Forest Nursery, RFD #1, Box 23A, Voluntown, CT 06384; 376-2513 ■

From tubing and trout fishing to riverfront redevelopment, clean water is 'step one' and

Worth the cost!

By Tess Gutowski,
Environmental Analyst, and
Charles Fredette,
Principal Sanitary Engineer,
DEP Water Compliance Unit

The progress of the clean water program in Connecticut can be illustrated by a case study of the Connecticut River and two of its major tributaries, the Farmington and Salmon rivers. Focusing on these rivers, we will highlight the numerous benefits of clean water, benefits which are enjoyed by us all, but which many of us may be taking for granted.

Until recently, the nation's rivers and harbors suffered the abuses of an inconsiderate society. Waterways were used as open sewers for the disposal of human wastes and the waste products of industry. They became unsuitable for swimming, and fish populations declined and disappeared.

Numerous dams interrupted river flows and choked off the magnificent spawning runs of salmon and shad. Many waters became unattractive and lost their recreational value. It has only been in recent years that this trend has been reversed and much of the damage has been repaired.

During the past 15 years, water pollution control programs established under State and federal mandates have significantly contributed to the improvement and maintenance of the quality of our water resources. Water shortages and pollution made it necessary for the State to act.

In 1965, Governor John Dempsey appointed a Clean Water Task Force made up of one hundred Connecticut citizens. Their charge was "to eliminate the pollution problem that we know exists and tell us the best, quickest and most efficient and economical way to eliminate it."

After many months of study, the Task Force issued a report

and recommended a plan for implementation. This plan was then translated into a law, Connecticut's Clean Water Act of 1967. The intent and purpose of the State's Clean Water Act is to protect and enhance the water resources of the State by the elimination of pollution.

Connecticut's Clean Water Program is operated in accordance with the requirements of Chapter 474a of the Connecticut General Statutes and is enhanced by the very comprehensive federal Water Pollution Control Act of 1972 and its Clean Water Act Amendments of 1977. The federal laws were patterned after Connecticut's laws, while programs in most other states had to be modified to incorporate national concerns.

We have estimated the magnitude of the cleanup effort by taking account of the millions of dollars spent by Connecticut municipalities and industries to install pollution control facilities. The continuing effort to protect water quality was quantified by an inventory of the annual costs to operate and maintain these installations.

We have also briefly reviewed the additional work which needs to be done for these rivers to attain Connecticut's adopted goal of providing waters suitable for boating, fishing, swimming, and all other forms of recreation.

Unfortunately, benefits are not so easily expressed in monetary terms. Yet, it can be readily argued that clean water opens up economic and social avenues impossible with polluted waters. Clean water adds to the enjoyment for those people living along the rivers, adds to the pleasure of water-based recreation, adds to the appeal of river-related tourist attractions, and enhances adjacent property values. Clean water contributes to the State's economy via income from boating, tourism, and river related sports. It also provides incalculable benefits by preserving sensitive habitats.

Although we focus on the Connecticut River, similar statements could be made about the Housatonic River, the Thames River, and other water resources in the State. The investments made by both the public sector and the private sector have been substantial, and the rewards have been gratifying.

The background

The Connecticut River is the largest river in New England, originating from a series of lakes just south of the Canadian border and flowing 400 miles south through four states to Long Island Sound. During the course of its journey, the river drains a land area of 11,000 square miles and drops 1800 feet in altitude. As it enters Connecticut it carries an average of 10 billion gallons a day --more than five times as much water as is delivered to Long Island Sound by the Housatonic River.

The final 70 mile stretch of the Connecticut River bisects the State of Connecticut from north to south, bordering 22 Connecticut towns and cities; the river is influenced by the tide from Hartford to Long Island Sound. The lower river valley is unique in that it is the last important estuary on the Eastern Seaboard unspoiled by indiscriminate industrial and commercial development.

Major tributaries to the River in Connecticut include the Farmington, Salmon, Scantic, and Hockanum rivers. The Farmington drains 602 square miles of land to the west of the Connecticut River in the north central area of the state. This river is approximately 54 miles in length, and 18 Connecticut and five Massachusetts towns lie along its banks. The Salmon River watershed consists of 94 square miles of land situated east of the Connecticut River in the central area of the State; along the Salmon's 10 stream-miles lie six Connecticut towns.

The Connecticut River flows through a diverse landscape in Connecticut which supports a rich variety of plant and animal life. The land along the river features four distinct ecoregions, each characterized by a unique composition of topography, geology, climate, vegetation, and animal life. The Farmington River watershed extends into three additional ecoregions, while the Salmon River is located within the Southeast Hills ecoregion.

Water Quality Goals, Conditions, and Improvements

In September 1980, Connecticut's Department of Environmental Protection (DEP) formally revised and adopted the State's Water Quality Standards and Criteria document. Standards for water quality are required by Section 25-54e of the Connecticut General Statutes and by Section 303 of the federal Water Pollution Control Act (FWPCA).

Connecticut's surface water goal is to restore and maintain these waters at a quality consistent with their use for the protection and propagation of fish, shellfish, and wildlife and with their use for water based recreation. This goal is often expressed by the term "fishable/swimmable quality" or Class B standard.

The existing water quality conditions and the water quality goals for the Connecticut, Farmington, and Salmon rivers are identified and described in the Connecticut Water Quality Standards and Criteria document, the proposed Connecticut River Basin water quality maps, and the "1982 Water Quality Report to Congress."

The Department of Environmental Protection's "1982 Water Quality Report to Congress" reported that 66 percent (or 46 of the 70 miles) of the Connecticut River in Connecticut fails to meet the State's water quality goal of Class B. Stream miles not in attainment are the 46 mile stretch of the Connecticut River from the Massachusetts/Connecticut State line to Hurd State Park in East Haddam.

The reason this section does not meet Class B standards is the occurrence of combined sewer overflows during storm events in Springfield, Massachusetts, and

Enfield, Hartford, West Hartford, Portland, and Middletown, Connecticut. Combined sewer overflows result in the discharge of untreated sewage to the river, making it periodically unsuitable for swimming and other forms of water contact recreation. Below Hurd State Park, the river has attained fishable/swimmable standards.

In contrast to the Connecticut River, the entire 54 mile length of the Farmington River has achieved and maintained its adopted goal of fishable/swimmable waters. However, two tributaries of the Farmington River--the Still and the Pequabuck--are polluted. Three of the 12 stream miles of the Still River do not meet adopted standards due to inadequately treated sewage from the Winsted municipal treatment plant. Twelve of the 15 miles of the Pequabuck River have unacceptable water quality due to industrial discharges, failure to complete sewer hook-ups, and inadequately treated sewage from the Plymouth, Bristol, and Forestville sewage treatment plants. The Pequabuck River is one of Connecticut's most severely polluted rivers.

The entire 10 mile length of the Salmon River is classified as fishable/swimmable. The Salmon River and its tributaries are protected by State law which prohibits the discharge of sewage or any other effluent which has had less than tertiary treatment. Furthermore, State policy protects Class A water bodies such as the Salmon River from any discharges of municipal or industrial wastewater.

The users

The Connecticut River is extremely accessible in that it lies in close proximity to Connecticut's entire population. Virtually all of the State's 3.1 million inhabitants live within 90 minutes of the river by automobile. Approximately half a million people live in the 22 Connecticut municipalities immediately adjacent to the river.

Thus, the river has the attention of a vast populace, and its qualities touch their lives in many tangible and intangible ways. The demand for the river's recreational offerings is high, and full utilization of water based recreation opportunities is assured. The demand will become even greater by the year 2000, as the population of the river municipalities is expected to increase 12 percent in the next 20 years.

The Farmington and Salmon rivers are as accessible to the State's residents as the Connecticut River. Approximately 180,000 people reside in the municipalities along the Farmington River. Adjacent to the Salmon River, municipal populations number over 26,000. These populations are also expected to increase significantly during the next 20 years.

River Oriented Organizations

Public interest in the Connecticut River has inspired the organization of several river oriented groups. These include:

Connecticut River Assembly, 214 Main Street, Hartford, CT 06115

The Connecticut River Assembly (CRA) was established in 1979 by the Connecticut General Assembly to create a program to preserve and protect the Connecticut River from Middletown to the Massachusetts border. The Assembly was established under Connecticut Special Act No. 79-77 as amended. It is composed of representatives of the Governor, 15 river towns, the Midstate Regional Planning Agency, and the Capitol Region Council of Governments.

Connecticut River Gateway Commission, P.O. Box 335, Essex, CT 06420

The Gateway Commission was established in 1973 by the Connecticut General Assembly to protect the natural, historic, and aesthetic values of the lower Connecticut River Valley. The Commission is composed of representatives of the Department of Environmental Protection, eight river towns, the Midstate Regional Planning Agency, and the Connecticut River Estuary Regional Planning Agency. As reported in the 1980 sixth Annual Report of the Connecticut River Gateway Commission to the State Legislature's Environment Committee, the program consists of an acquisition component and a land-use component.

Connecticut River Watershed Council, Inc., 125 Combs Road, Easthampton, MA 01027

The Connecticut River Watershed Council is dedicated to the proper use of natural resources in the four-state Connecticut River Valley. The organization has developed programs in conservation education and research, land acquisition for conservation and recreation, water quality testing, and fisheries restoration. (New England River Basins Commission, 1981)

Farmington River Watershed Association, 135 West Main St., P.O. 98, Avon, CT 06001

The Farmington River Watershed Association's (FRWA) purpose is to protect the river and its watershed, encourage its wise use, and to increase awareness of the many values associated with it. It was founded in 1953 by a group of concerned area residents, who were disturbed by the worsening pollution of the Farmington River.

Great Meadows Conservation Trust, Inc., 400 Hartford Avenue, Wethersfield, CT 06109

The Great Meadows Conservation Trust, Inc., was established to promote the preservation of floodplains of the Connecticut River and its tributaries. The Trust also works to encourage the preservation of agricultural land through the acquisition of key parcels through gift/purchase.

International Atlantic Salmon Foundation, P.O. Box 651, Hanover, NH 03755

The International Atlantic Salmon Foundation, Inc., is dedicated to the preservation, restoration, and wise management of Atlantic salmon wherever this renewable resource is found. In New England, the Foundation works closely with the two federal agencies and four state agencies involved in the restoration effort. (New England River Basins Commission, 1981)

The Connecticut River Salmon Association, Inc., 273 Wetherly Trail, Guilford, CT 06437

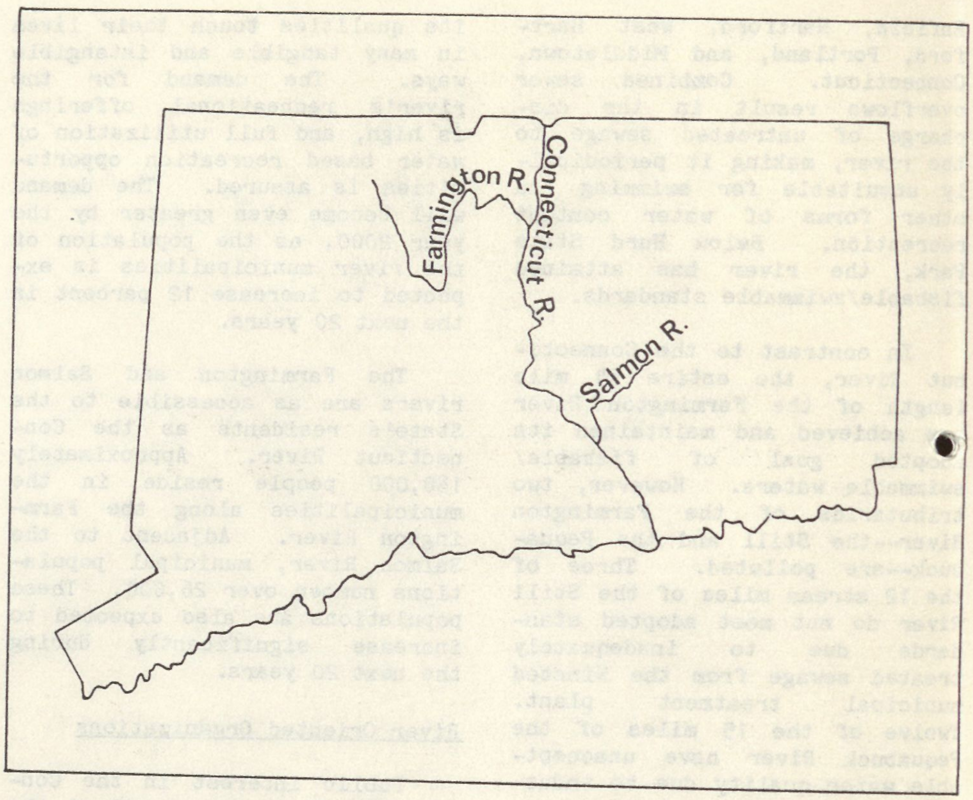
The Connecticut River Salmon Association, Inc., was founded to restore the Atlantic salmon to its historic range in the Connecticut River watershed. The association has worked with federal and state agencies to have fishways installed at the mainstream dams on the Connecticut River, and has prepared a management scheme for the Atlantic salmon fishery in the Connecticut River. (New England River Basins Commission, 1981)

Pollution control costs

The capital costs for improving the quality of the water in the Connecticut River have been quantified through an accounting of expenditures to build wastewater treatment plants and associated wastewater collection systems. The continuing annual costs for preventing water quality degradation were similarly quantified by inventorying costs for operating and maintaining treatment systems. The costs for achieving adopted water quality goals are estimated by presenting estimates of costs for future scheduled municipal projects.

Municipal Treatment Plants

The municipal construction grant program has been responsible for the elimination of vast numbers of untreated or partially treated sewage discharges during the years 1967-1982 by providing grants for the construction of municipal sewage treatment plants and sewers throughout the State.



Construction Costs: The public investment in municipal wastewater treatment plants along the Connecticut River is substantial. More than $108 million has been spent to install these plants over the last 15 years. When expressed as inflated 1981 dollars, the total cost exceeds $260 million.

Costs for installing municipal treatment plants along the Farmington River from 1959 to 1981 were more than $22 million. This figure translates to approximately $49 million when expressed in terms of 1981 dollars.

There are no treatment plants in the Salmon River Watershed.

Annual O&M Costs: The annual costs to operate and maintain the 12 treatment plants on the Connecticut River were over $7 million in 1980. These costs are borne by the municipalities, with no State or federal funding assistance. The annual expense of operating and maintaining the 10 facilities in the Farmington River watershed is approximately $1.8 million.

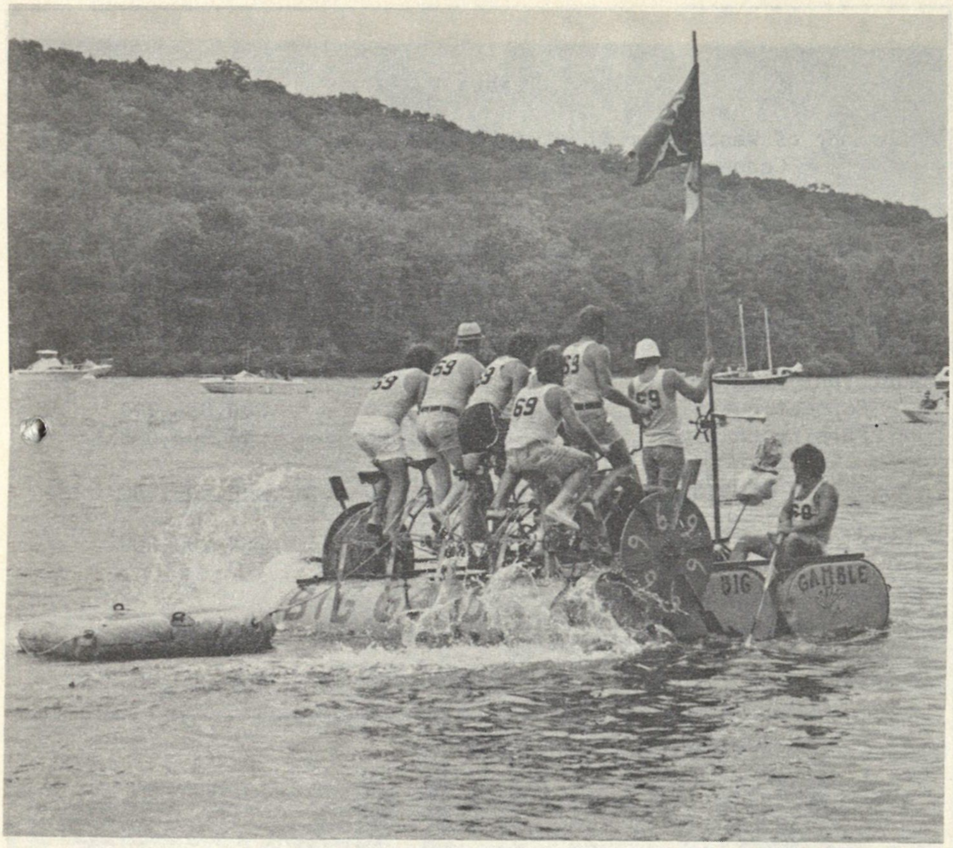
Future Costs: Three additional major treatment plant projects are scheduled for towns along the Connecticut River with a total projected cost of $19 million. These projects involve improving the Windsor Locks, Suffield, and Portland treatment plants.

Four future major projects which are scheduled for the Farmington watershed will cost an additional $51 million; expansion and upgrading of the Winsted treatment plant ($8 million) will improve water quality in the Still River; expansion and upgrading of treatment facilities in Bristol ($30 million) and improvements to treatment in Plymouth ($7 million) will improve water quality in the Pequabuck River. Two Bradley Field sewage treatment plants will tie into the expanded MDC Poquonock sewage treatment plant ($6 million).

Municipal Wastewater Collection Systems

The public investment in clean water includes the cost of wastewater collection systems (sewers, pump stations, force mains) as well as the cost for treatment plants.

Construction: In order to examine the magnitude of the



Participants and observers enjoy annual Connecticut River Raft Race.

public's investment in collection systems, the cost for projects in municipalities along the Connecticut River was tallied. The inventory included only projects near the river which would have a direct bearing on the quality of the river. More than $68 million has been spent since 1970 on projects included in this inventory. In terms of 1981 inflated dollars, these expenditures exceeded $92 million.

Future Costs: Future collection system projects will focus around five Connecticut River municipalities which are served in whole or in part by combined sewers which convey sanitary sewage and stormwater in a common pipe. During periods of rain the volume of runoff greatly exceeds the hydraulic capacity of the pipe causing overflows at pump stations and at overflow structures and bypasses at sewage treatment plants.

This sewage overflow is discharged to the receiving stream without any treatment. Removal of gross solids, sedimentation of finer solids, and disinfection are not achieved. The impacts on the receiving stream include impaired aesthetics caused by floating solids, decreased dissolved oxygen caused by the organic wasteload in the sewage and resulting in detrimental impacts to aquatic life, and gross contamination by bacteria and other pathogens. The obvious results are lost recreational opportunities, closure of shellfish areas, and public health threats.

Combined sewer overflow problems are the principal reasons the Connecticut River does not meet Class B fishable/swimmable standards from Enfield to East Haddam. Overflows in towns of Enfield, West Hartford, Hartford, Middletown, and Portland (as well as in Holyoke and Springfield, Massachusetts) cause the river to be unsuitable for swimming from Enfield to East Haddam. The estimated cost for correcting these problems in Connecticut is $94 million.

Industrial Wastewater Treatment Plants

In order to obtain estimates of money spent by private industry to build and operate wastewater treatment systems, the Department of Environmental Protection's Water Compliance Unit mailed a questionnaire to industries located in towns along the Connecticut River and the Farmington River which have wastewater discharge permits. Since the Salmon River is not used for waste assimilation, there are no industrial treatment costs to report.

A total of 49 industries responded to the questionnaire. Forty-one responses provided cost information which was used to quantify industrial costs. Of the 41 industries, 29 discharge treated wastewater to the Connecticut River or its tributary surface waters. The remaining 12 discharge treated wastewaters to municipal sewers prior to discharging to the river.

Construction Costs: The 41 industries spent a total of $30 million through the years to install wastewater treatment systems. Three industries reported initiating construction in the 1950s, and nine reported beginning work in the 1960s. Eleven industries initiated projects during the period 1970-1974. In many cases, construction was phased over a period of years. It is not possible to accurately express costs in 1981 dollars. However, inflation would easily have doubled these costs to at least $60 million in 1981.

Annual O&M Costs: The 41 industries reported present operation and maintenance costs totaling nearly $4.6 million. These costs are continual costs which are incurred each year, and which generally increase with inflation.

Municipal and Industrial Cost Summary

A summary of the Connecticut River and Farmington River cleanup costs inventoried in our research has been presented in

Tables 1 and 2. Although this inventory does not account for all the money spent in Connecticut for the cleanup, it does serve to emphasize the magnitude of the investment. In terms of 1981 dollars, close to half a billion dollars in capital expenditures are accounted for. The continuing daily operation and maintenance cost of these wastewater facilities exceeds $13 million per year.

The costs for scheduled future projects are summarized in Table 3. It is estimated that public expenditures totalling $165 million will be needed to achieve adopted water quality goals on the Connecticut, Still, and Pequabuck rivers.

The benefits

Unlike cleanup costs, the benefits associated with clean water are not easily expressed in monetary terms. Clean water adds value to the daily life experience along the river and to the enjoyment of the various forms of river recreation. These benefits cannot be quantified in millions of dollars but are values which the clean water program has sought to restore.

Aesthetics

The overall attractiveness of the river plays an important role in determining the level of enjoyment experienced by river users. Boaters, fishermen, tourists, and other users owe much of their pleasure to the river's positive appeal to their senses. Connecticut's clean water program is responsible for controlling wastewater discharges which would otherwise detract from the river's aesthetic appeal. Consequently, the river seldom suffers from discolorations, floating solids, scums, noxious odors, and nuisance biological growths which would result from pollution.

Agriculture

Most of the river water that is utilized by agriculture in the Connecticut River Valley is used to irrigate tobacco, vegetable crops, fruits, and nursery stock. Good water quality is

Table 1

Summary of wastewater treatment plant construction costs for the Connecticut and Farmington rivers, 1960-1980.

	Capital Expenditures	
Facilities	Actual expend. 1960-1980	1981 dollars
Municipal Plants		
Connecticut River	108,000,000	260,000,000
Farmington River	18,000,000	44,000,000
Industrial Plants	30,000,000	60,000,000
SUBTOTAL (Plants)	156,000,000	364,000,000
Municipal collection systems		
Connecticut River	68,000,000	92,000,000
Total	224,000,000	456,000,000

Table 2

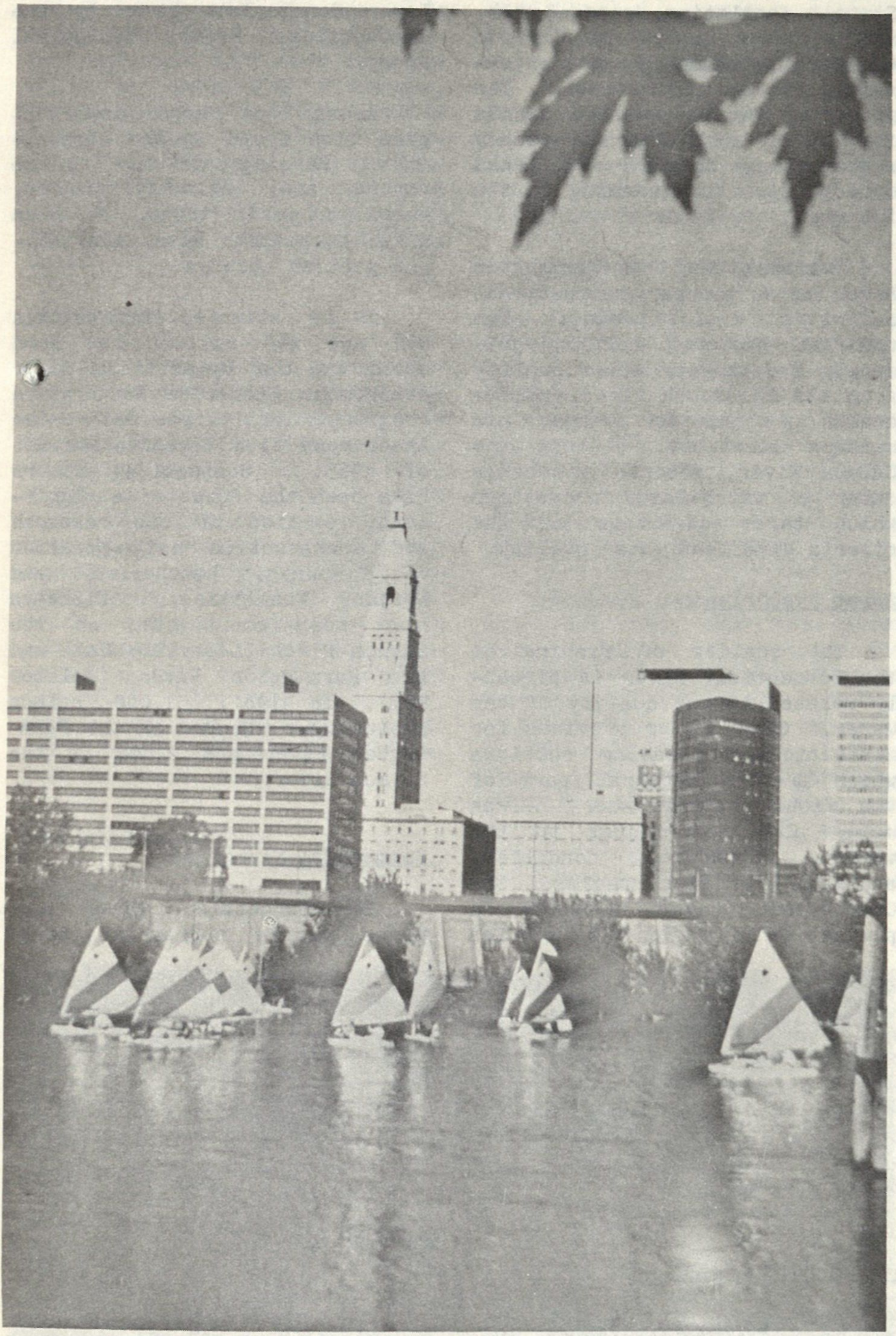
Annual wastewater treatment plant operation/maintenance costs for the Connecticut and Farmington rivers, 1980.

Facility	Actual Expenditures 1980
Municipal Plants	
Connecticut River	7,400,000
Farmington River	1,500,000
Industries	4,600,000
Total	13,500,000

Table 3

Future project cost summary for the Connecticut and Farmington rivers.

Project	Future Project Cost
Municipal Plants	
Connecticut River	19,000,000
Farmington River	51,000,000
Combined Sewer Overflow	
Connecticut River	95,000,000
Total	$165,000,000



Dominick Ruggiero. Dept. of Economic Development

Hartford's skyline provides the backdrop for a Sunfish competition.

essential for irrigation systems; polluted water leads to clogged, inoperable systems. Not all growers are using irrigation but there is a trend toward applying irrigation to an increasing number of acres in the valley. In 1980, approximately 11,500 acres of 33,922 acres of harvested cropland in Hartford County were irrigated with water from the Connecticut or Farmington rivers.

Tourist Attractions

Several popular tourist attractions have close ties to the Connecticut River and owe much of their appeal to the river's excellent quality. The following have been actively promoted in vacation guides by the Tourism Division of the Connecticut Department of Economic Development.

Connecticut Valley Railroad

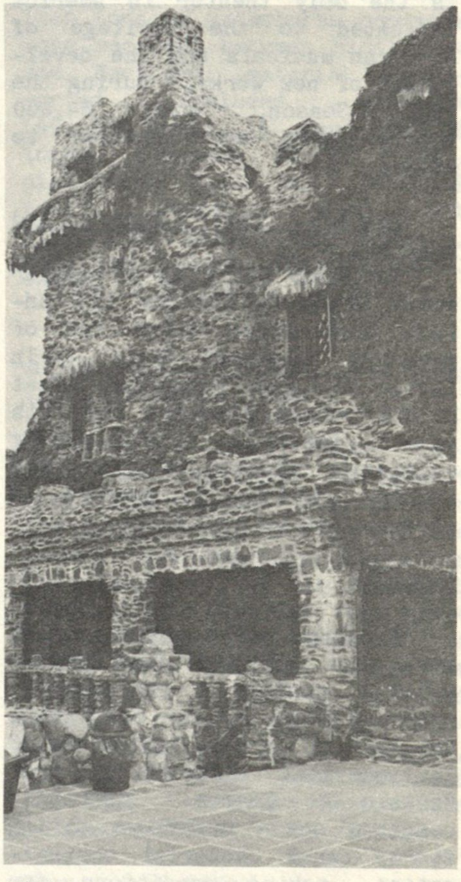
The Valley Railroad is a vintage steam train which carries passengers along the river on an hour-long round trip between Essex and Chester. A cruise by riverboat is an optional addition to the trip; passengers transfer from the steam train to a river boat at Deep River for a trip to Essex. In 1981, approximately 100,000 people enjoyed the river via this route.

Connecticut River Foundation at Steamboat Dock

This popular museum exhibits models, paintings, tools, and instruments relating to river history. Located in Essex, the facility also features a riverside park.

Connecticut River Ferries

Two ferries ply the Connecticut River from early spring to late fall. The Glastonbury ferry has been in operation since 1655 and is the oldest ferry in continuous operation in the country. The Chester to



Rosemary Gutbrod

Gillette Castle State Park is among the state parks and forests that border the Connecticut.

Hadlyme Ferry transports vehicles across the river in the lower valley.

Fourth of July Connecticut River Festival

This year marked the second annual Fourth of July river festival in Hartford. Celebration activities included a pleasure boat parade and fireworks display.

New England Steamboat Lines

The 400 passenger ship "Yankee Clipper" takes daily excursions down the lower Connecticut River and across Long Island Sound to Long Island.

Restaurants

Numerous restaurants can be found close to the river. Among the better known are the Gelston House (East Haddam), the Griswold Inn (Essex), Town Farms Inn (Middletown), and Dock 'n Dine (Old Saybrook).

Goodspeed Opera House

Built in 1876 and restored between 1960-1963, the Goodspeed is the only theater in America dedicated to the heritage of American musicals and the development of new works. During the 1982 Season, some 84,000 theater-goers are expected to attend.

Windsor Shad Derby and Festival

The Shad Derby is a popular event which celebrates the annual Connecticut River run of spawning American shad. In 1981, it was estimated that 20,000 people attended the 26th annual festival. The derby originally started as a one day fishing derby to promote a cleaner Connecticut River.

Swimming

Although the Connecticut River has achieved considerable water quality improvement, water-contact sports are still not advised by the Department of Environmental Protection from Enfield to Haddam. Periodic combined sewer overflows during storms cause bacterial contamination, making conditions for swimming hazardous to health. While there is no official bathing river frontage and no State facilities, on warm, summer days many people do engage in swimming and water-skiing on the lower river. The potential for water-based sports is great and numerous sandy sites along the river's banks hold promise for swimming in the future.

Swimming in the Farmington River is a popular recreational activity. Again, periodic high coliform bacteria counts, primarily due to poor water quality from the Pequabuck River, pose a health problem to swimmers in certain locations. Along the Salmon River, resorts and camps cater to water-based recreation which takes advantage of the river's excellent water quality.

Sport Fisheries

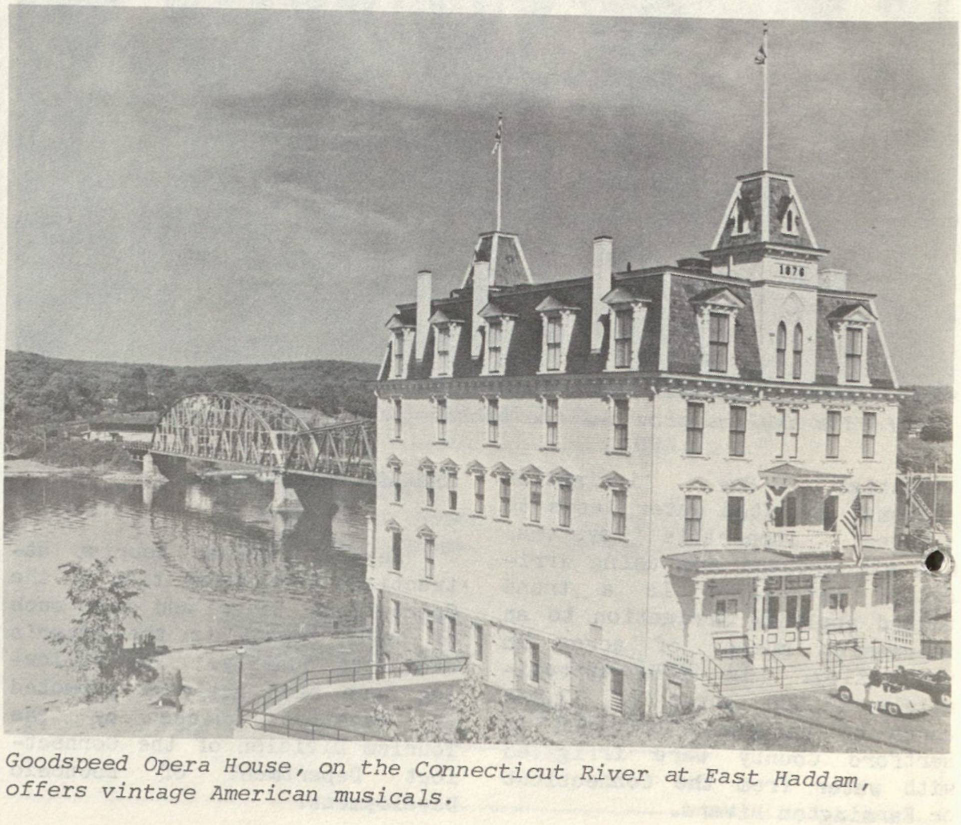
The quality of fishing on the Connecticut River is directly related to the quality of the water. Clean water provides for aesthetically pleasing settings which are an integral part of the fishing experience. Clean water also contributes to the variety, abundance, condition, and health of fish species. The Connecticut River supports a productive fishery; 50 species have been identified in the lower Connecticut River by the Connecticut River Ecological Study.

Among the more important game fish found in the Connecticut, Farmington, and Salmon rivers are: Atlantic salmon, American shad, trout, northern pike, largemouth bass, and various panfish species.

It is estimated that between $50 and $60 million has been spent on the Connecticut River Anadromous Fisheries Restoration Program, instituted under the Anadromous Fish Conservation Act of 1965. Connecticut waters have been the focus of a significant portion of the research and construction and operation of fishways, hatcheries, and holding facilities. Fishways have been constructed on the Salmon River (Leesville Dam) and the Farmington River (Rainbow Dam). In 1981, 57,000 salmon smolts were stocked in the Farmington River and 9,000 in the Salmon River.

Commercial Fisheries

The Connecticut River supports viable commercial fish-



Dominick Ruggiero

Goodspeed Opera House, on the Connecticut River at East Haddam, offers vintage American musicals.

eries for several species. In 1980, 167 metric tons of American shad were harvested from the River by commercial fishermen. The Connecticut River white perch fishery has yielded profits for commercial netters for many years. Eel pots are also set in the river to collect American eels for specialized markets.

Shellfish

The Connecticut River estuary is closed to recreational shellfish harvesting because the bacteriological levels in the overlying waters fail to fall within allowable limits. The shell fisheries of the Connecticut River estuary are not extensive nor do they support any significant commercial enterprise. Oyster operators do a small amount of commercial oystering on beds near the mouth of the river. The commercial harvesting of soft-shell and hard-shell clams has not been important in recent years.

Recreational Boating

Demand: Improved water quality has greatly enhanced the Connecticut River's attractiveness for recreational boating. Among the various ways people explore and enjoy the river are via power boats, sailboats, rowboats, canoes, and drifting vessels.

Rising consumer incomes, a burgeoning population, and increasing leisure time have produced a growing demand for water resources suitable for boating activities. The last 15 years has seen a doubling of boating activity between Long Island Sound and Hartford. The New England River Basins Commission (1980) reports that existing peak day traffic of 700 boats between Old Saybrook and Hartford is expected to increase to 20,000 by the year 2020.

Boat Launches/Yacht Clubs: There are seven State and public boat launches on the Connecticut, Farmington, and Salmon rivers. Connecticut's Department of Environmental Protection maintains boat launch sites at Enfield, Windsor, Haddam, and Old Saybrook on the Connecticut River, at Rainbow Reservoir and Pequonock on the Farmington, and at East Haddam on the Salmon River. Heavy demand at these access points easily exceeds the available parking spaces. Nine yacht clubs are also situated along the Connecticut River.

Marinas: Twenty-eight private marinas are situated along the Connecticut River from Wethersfield Cove to Old Saybrook. These marinas provide moorings for 2,107 boats. A majority of these marinas are at capacity with expansion expected at some facilities. Cumulative boat values and marina gross incomes are each estimated to be many millions of dollars.

Regattas and Races: During 1980 and 1981, the U.S. Coast Guard issued 61 permits for regattas and other boat races on the Connecticut River. Permit requests for 1982 are expected to exceed previous years. Crew teams from two universities --Wesleyan and Trinity--use the river. One of the most popular events, the Connecticut River Raft Race, attracts thousands of people each year, either as participants or as observers.

Canoeing: In recent years, the number of canoes on the Connecticut River has increased along with other boating. River outfitters report that 35 organized canoe trips were conducted on the river last year, with nearly 1,100 people participating. Numerous private canoe trips are also taken each year.

Farmington and Salmon River Boating: Canoeing, tubing, and kayaking are enjoyed by thousands of people on the Farmington River each year. The Farmington River Watershed Association prepares weekly river condition reports for river users. It is estimated that more than 10,000 user days of boating are currently realized on an annual basis.

From 1978 to 1981, 24 regatta and boat racing permits were issued to various boating clubs for events on the Farmington. The Appalachian Mountain Club sponsors races and canoe trips which annually account for an estimated 1,200 canoeist user days. The Farmington River is a prime whitewater canoeing stream where national competitions are held. Two sporting goods outfitters report yearly canoe rentals of approximately 2,000. Tubing is an exceptionally popular pursuit, with an estimated 40,000 tube rides taken in 1981.

The Salmon River, particularly at its mouth, is another popular boating river. A State boat launch is situated on the Connecticut River at the mouth of the Salmon River. The University of Connecticut Outing Club and Connecticut Canoe Racing Association hold races on the river. Boating is also an attraction at private vacation resorts along the Salmon River.

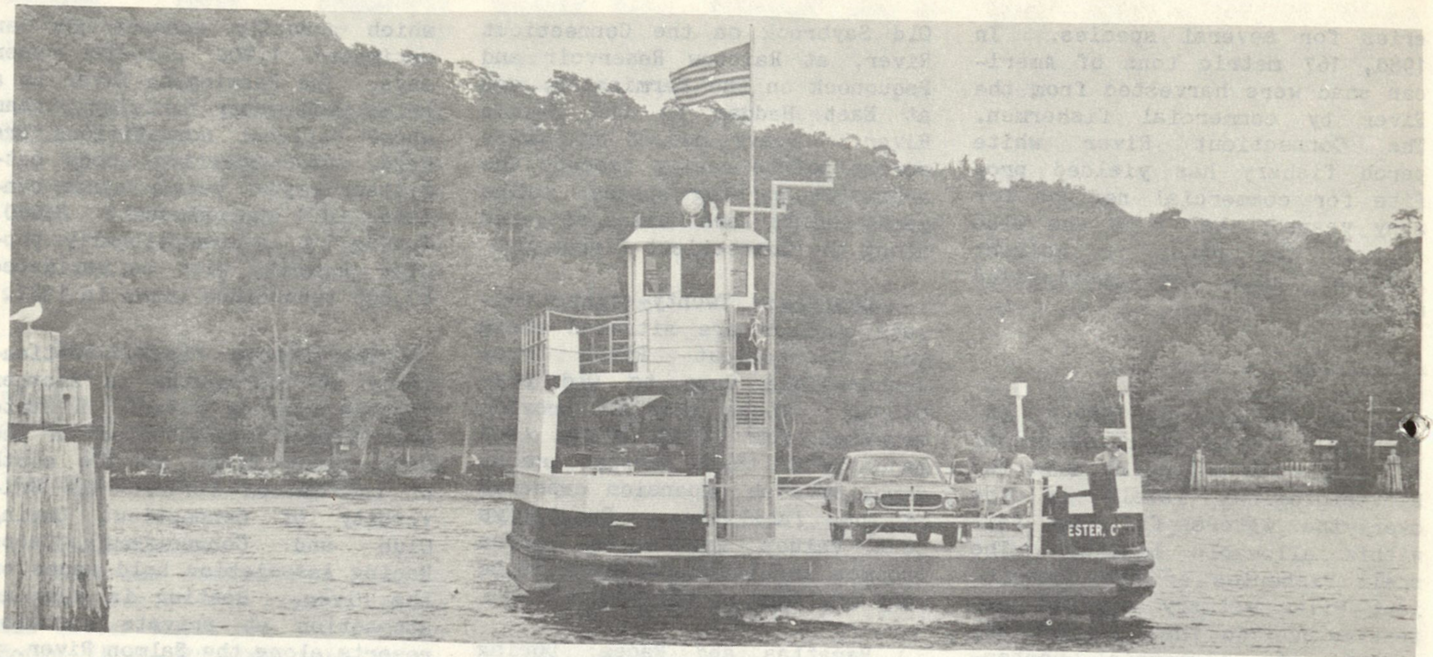
Commercial Navigation: Although commercial navigation on the Connecticut River remains important, it has been decreasing. Commercial traffic along the river in 1969 totaled 4.487 million tons. In 1978, 1.9 million tons of waterborne commerce were received between Middletown and Hartford; material transported included gasoline (499,568 tons), jet fuel (48,052 tons), kerosene (8,002 tons), distillate fuel oil (257,066 tons), residual fuel oil (1,054,467 tons), and asphalt, tar, and pitches (83,444 tons). (Corps of Engineers, 1978)

State Parks, Forests, and Wildlife Management Areas

Numerous State parks, forests and wildlife management areas are located along or near the Connecticut, Farmington, and Salmon rivers and are managed by the Department of Environmental Protection. Recorded 1980 visitor attendance at three of the State Parks situated along the Connecticut River exceeded 460,000. At the two State Forests bordering the Farmington, 186,000 visitors were recorded for 1980. A short description of some of these areas follows:

Connecticut River

Hurd State Park (884 acres) East Hampton . . . situated on



Dominick Ruggiero

Chester to Hadlyme ferry has crossed the Connecticut River since 1769.

the high east bank of the Connecticut River; hiking; picnicking; shelter; fall foliage; canoe camping; 1980 attendance 26,962.

Haddam Meadows State Park (175 acres)

Haddam . . . situated in the flood plains of the Connecticut River; boat launch; fishing; picnicking; 1980 attendance 81,411.

Gillette Castle State Park (184 acres)

Four miles south of East Haddam off Route 82 . . . features include picturesque stone castle on high rise above the Connecticut River; picnicking; hiking; canoe camping; 1980 attendance 349,206.

Selden Neck State Park (528 acres)

Lyme . . . wooded island; canoe camping.

Haddam Island State Park (14 acres)

Haddam . . . sandbar, wooded island.

Dart Island State Park (2 acres)

Middletown . . . natural area.

Higganum Meadows (256 acres)

Haddam . . . some wetlands and upland, mostly open upland area adjacent to Connecticut River.

Cromwell Meadows Wildlife Management Area (496 acres)

Cromwell . . . mostly marsh, level ditching, open upland area.

Nott Island (82 acres)

Lyme . . . brackish marsh; open water; mud flats.

Wangunk Meadows (505 acres)

Portland . . . reverting and cultivated fields, marsh, some hardwoods.

Great Island (504 acres)

Lyme . . . tidal marsh with numerous creeks; managed for waterfowl hunting; duck blinds.

Lord's Cove (265 acres)

Lyme . . . tidal marsh; managed for waterfowl hunting; duck blinds.

Farmington River

American Legion State Forest (782 acres)

Barkhamsted . . . scenic hiking trails, camping along the East Branch of the Farmington River, stream fishing, hunting and picnicking; State wildlife management area.

People's State Forest (2942 acres)

Barkhamsted . . . picnicking, snowmobiling, hiking, fishing and hunting; state wildlife management area.

Nepaug State Forest (1,199 acres)

New Hartford . . . hiking and hunting; State wildlife management area.

Salmon River

Salmon River State Forest (6115 acres)

Colchester . . . fishing, hiking, hunting, picnicking.

Wopowog Management Area (473 acres)

East Hampton, Haddam and East Haddam . . . mixed hardwoods, reverting fields, two streams; hiking.

Unique Environmental Areas

Unique environmental areas which are sensitive to river water quality lie throughout the Connecticut River area. Among these are flood plains, inland wetlands, tidal wetlands, and the estuary area.

Riverfront Development

Three Connecticut River municipalities have recently "rediscovered" the economic and social values of the river. A short description of riverfront "recapture" efforts by Hartford, Middletown and Portland follows.

Hartford Riverfront

On August 1, 1980, the City of Hartford Planning Department issued a report, "Basic Criteria for Guiding Riverfront Neutralization." This report proposes establishing interim criteria for guiding riverfront development until an overall plan for the riverfront can be prepared and adopted. It recommends that a comprehensive plan for the riverfront should be initiated by a waterfront action group consisting of interested public, business, and nonbusiness representatives. Recently, the corporate-funded Riverfront Recapture, Inc., completed a study which proposed a new alignment for Interstate 91 which, if constructed, would restore Hartford's historic link with the river.

Middletown Waterfront Improvement Project

The City of Middletown undertook a construction project at a cost of $1.7 million dollars to reclaim and rejuvenate its valuable waterfront property. The project consisted of the construction of 1,500 feet of bulkhead and boardwalk, the renovation of an abandoned yacht club building for commercial use, the construction of a rowing shell boathouse, the installation of floating docks for launching shells, the installation of an excursion boat docking area with supporting shelter, the relocation of a university boathouse, and the expansion and improvement of a waterfront park with surface games and other park activities (C.E. Maguire). The riverfront is used extensively by the public for fishing and picnicking.

Portland Riverfront

The Connecticut General Assembly in the 1977 Session granted Portland jurisdiction over its entire riverfront to midstream by Special Act 77-75. This enables the town to plan the development of the land along its ten miles of river frontage. Among the various uses proposed for the river frontage are wildlife preserves, multiple and single family dwellings, a boatyard/yacht club, and other activities.

Conclusions

During the mid-1960s, Connecticut's citizens recognized polluted water as unacceptable and authorized public monies to restore a resource which had suffered decades of abuse. We are now realizing the benefits of this decision, and the present generation is enjoying fishing, swimming, and boating opportunities which were inconceivable a few decades ago. Salmon and shad in the Connecticut River, tubing on the Farmington, trout fishing in the Salmon River, swimming, pleasure boating, and numerous other activities in these rivers . . . all are possible only because of the State's strong commitment to the Clean Water Program.

This State has achieved a remarkable 93 percent success rate in the cleanup of its waterways. We have identified more than $400 million in capital expenditures to clean up the Connecticut River alone. However, much additional work remains to be done to complete the cleanup effort and to protect clean waters from future degradation. Approximately $860 million will be needed in the near future to complete State wastewater projects required to meet the "fishable/swimmable" goals. Millions more will be needed to maintain wastewater treatment projects which have already been completed.

Facing the specter of diminished federal funding, the State must review its water quality management programs and policies. We no longer can rely on the largess of the federal government to help us solve our water pollution problems. New avenues of funding must be explored, with serious consideration given to user fees, new taxes, special legislative appropriations, and new bonding authorizations. Enforcement actions against municipalities which fail to comply with pollution abatement orders due to lack of grant money are now being faced for the first time. Support for such State actions is needed from the public.

The clean water program cannot be the bailiwick of government agencies alone. All of Connecticut's residents benefit from clean water in one way or another. The public must become actively involved in water quality management via economic and political support.

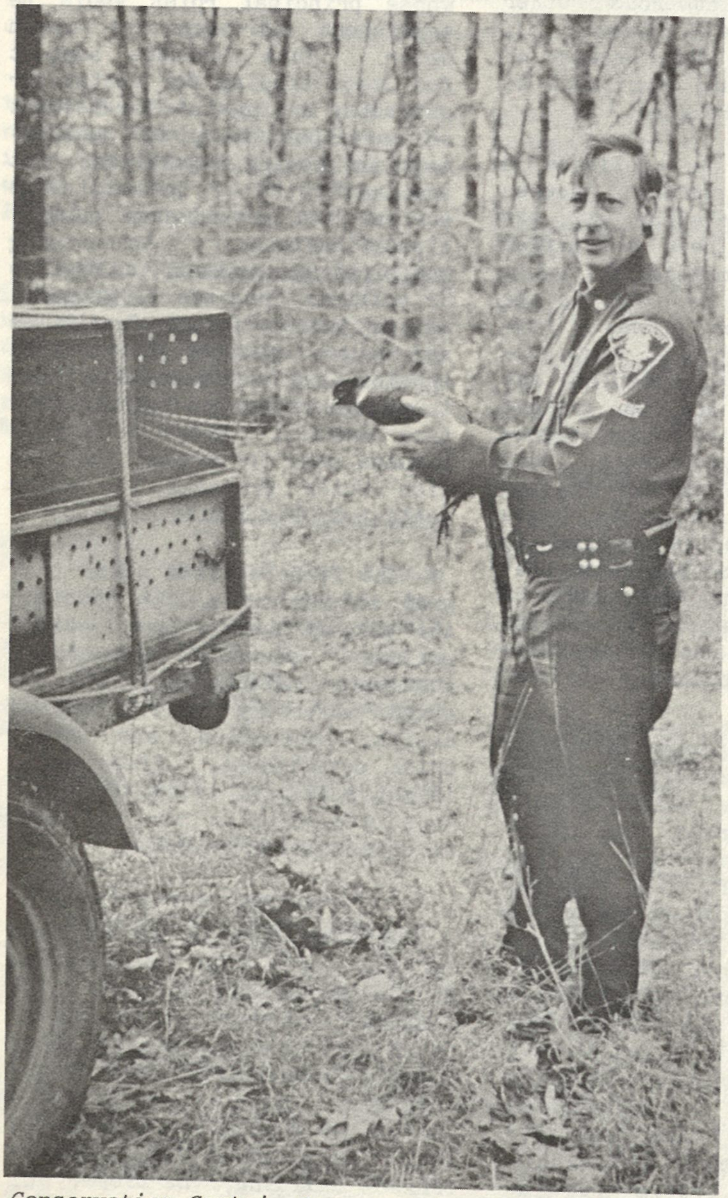
Existing resource-oriented organizations must become aware of the changing federal priorities and must accept more responsibility for promoting greater State and local funding for water pollution control projects and programs. There may be a need for new organizations whose principal roles would be persistent advocacy for clean water. This includes support for State bonding for wastewater projects; urging the development of municipal plans of development and zoning regulations that are supportive of the statewide surface and groundwater quality classifications; encouraging municipal government to develop or maintain programs to properly manage public sewage facilities and septic systems, to minimize erosion and sedimentation, and to manage other non-point pollution sources. There is a continuous need to support legislation which protects the water quality in the State.

The State's clean water program is expensive, but consider the alternatives: open sewers, noxious odors, unregulated wastewater discharges, all of which adversely affect public health, recreation, and industrial development. Clean water is not a luxury, it is the basis of a life which we have all come to expect and appreciate! ■

This article is an abridged version of "The Connecticut River: Worth the Cost!" The complete 65-page publication, including detailed data on water quality classifications and treatment plant construction costs, is available from DEP's Water Compliance Unit, State Office Building, Hartford, CT 06106; 566-2588.

By Mark Clavette, DEP Wildlife Biologist

Recreation replaced natural production as goal of State's pheasant program



Conservation Captain Harry Csech releases a pheasant.

Peter Bogue

The fall pheasant hunting season is fast approaching and officially opens at 7 a.m. on October 16. As my hunting comrades and I make plans for our traditional opening day breakfast and outing, the DEP is already in full throttle with pheasant stocking efforts to insure that the day will be a memorable one.

This year will mark the 75th year that the Department of Environmental Protection's Wildlife Bureau (formerly the Board of Fisheries and Game) has been actively involved in statewide distributions of ringnecked pheasants. For the benefit of thousands, pheasant stocking has supported a passtime which has gained tremendous popularity, while the ringneck has become the number one game species sought by Connecticut's sportsmen.

From the first official release of 88 birds in 1908 on Terry's Island, Windsor Locks, pheasant stocking has varied through the years to accommodate changing habitat conditions and increasing demands from the hunting public.

Early stocking attempts in Connecticut, as in other Eastern states, were stimulated by successful introductions of these exotic birds elsewhere in the country, particularly in the grain-producing regions of the Midwest. Pheasant stocking offered a bright new prospect for perpetuating the sport of small game hunting in Connecticut. As biologists witnessed populations of native grouse and quail dwindling in the early 1900s, the pheasant was introduced as a "buffer" species to remove pressure from and provide a partial replacement for once abundant native game birds.

From 1908 to 1949, fish and game regulations outlawed the shooting of hen pheasants in hopes that natural pheasant reproduction would sustain an acceptable level of hunting opportunity. To help meet this goal, state game farms were established and began raising pheasants.

In 1908, under the 10-week-old pheasant liberation program, state facilities and private farms began raising pheasants to 10 or 12 weeks of age and distributing the birds through the state for release in August and September.

The release of adult pheasants in Connecticut's early stocking programs began with releases of mature pheasants as breeding stock in the spring of each year. Pheasants were liberated in ratios of one male to five females and were intended to provide a shootable surplus of naturally produced birds.

Both these stocking programs continued for nearly 40 years with limited success, while the cost of producing every pheasant which reached the hunter's bag increased greatly. At a time when the cost of 10- to 12-week-old birds averaged $1.50 per bird, studies indicated that actual cost per bird returned to hunters' bags was in excess of $10.50. It became obvious that there was a great loss of pheasants between the time they were stocked and the time they were taken.

There were attempts in 1922 to purchase only range-raised pheasants instead of pen-raised birds, since the game farm stock was far less suitable from a survival standpoint under Connecticut's habitat conditions than pheasants raised in the wild. Natural pheasant breeding was limited, however, and predation, limited food supplies, and harsh weather conditions continued to affect the survival rates of stocked pheasants.

In an effort to overcome the inability of the game farm pheasant to survive for any extended period of time and to increase hunter bag returns, a. pre-season stocking program was initiated. This program continued on a limited scale until it was replaced with what was proposed to be the most effective, cost efficient method of stocking. By 1941, pheasant stocking in the State of Connecticut was primarily through during-season liberations of adult pheasants. These releases consisted of nearly all male (cock) birds stocked during the months of the open pheasant season. From 1941 to 1948 the cost of releasing adult cock pheasants averaged $3.13 per bird, and peak annual distributions totaled 18,600 birds.

Although natural pheasant propagation was minimal, wild birds helped satisfy the demand at a time when there were relatively small numbers of pheasant hunters. A banding survey conducted in 1941 concluded that one-half of the total statewide pheasant harvest came from natural pheasant populations.

In 1942 an additional effort to augment native pheasant production was made with the adoption of a post-season (winter) release program. Wildlife biologists hoped pheasants released at that time of the year would become hardy under winter conditions and provide better breeding stock the following spring. Survival rates remained low, however, due to lack of winter cover and predation.

While various stocking programs were being tested and modified during the early periods, several state-sponsored cooperative pheasant programs were established to supplement regular pheasant liberations.

In 1915, under the Cooperative Egg Program, pheasant eggs were purchased or provided by the State and delivered to private individuals who were required to hatch, raise, and liberate the birds at maturity. Success rates , however, were very low due to losses incurred during incubation and hatching.

The egg program was abandoned in 1935 and replaced in 1942 by the Cooperative Day-Old-Chick Program. Although raising pheasants from day-old chicks continued to be a challenge, and although disease and predation accounted for losses, success rates were much greater than those achieved under the egg program.

In 1946 the program was changed to incorporate a more hardy, disease resistant bird. Under the cooperative six-week-old pheasant program, pheasants were purchased by the State at the age of six weeks and distributed to clubs meeting the minimum pen and space requirements of the program. Cooperators agreed to raise and release these birds on lands open to public hunting. Department personnel provided assistance through periodic inspection designed to detect potential problems in time to prevent large losses of birds. Success rates averaged well above 70 percent, with some clubs releasing 100 percent of the birds provided. The cooperative pheasant programs proved valuable, as a sizeable portion of during-season, post season, and spring liberations were a direct result of these efforts.

Pheasant stocking for natural propagation soon was recognized as an unrealistic goal, and more attention began to be directed to sportsmen's needs in Connecticut's pheasant programs of the pre-1949 period. Greater emphasis was placed on during-season liberations, which made reasonable numbers of cock pheasants readily available to greater numbers of sportsmen.

Providing hunting opportunities by this method met with the hunting public's approval, and the popularity of pheasant hunting as a form of outdoor recreation grew enormously. Soon, the

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Wild asters

By G. Winston Carter
Illustrations by Pamela Carter

New England aster

Each year as goldenrods and Joe Pye weeds begin to appear along roads and in fields and meadows, there is a general awareness that summer is slowly slipping away. This means that we can anticipate a somewhat different display of common wildflowers. The time is fast approaching for a colorful but somewhat more complex group of plants: September and October are the months for the composites. These are considered the most advanced among our many flower families.

The purpose of this article is not to make you an expert on composites but to introduce you to this plant family and to show you how you can make a start in tackling what many consider a very difficult group to study. I myself always pledged to leave them alone, but I have found the temptation to know more about them irresistible. To start with, a few types stand out, and once you get the basic flower structure down and learn a few of the major differences among the different kinds of composites, particularly asters, you have taken a big step forward.

The composites are a very large and flourishing group of plants. This is probably due to the fact that they are hardy and have many ways of adapting for survival, including special devices for seed dispersal. They have very compact flower heads with many florets in each head. This is what gives the family its name.

Composites are also easily pollinated. An insect can readily make a trip to one flower head then travel to many individual flowers with the pollen collected.

While hybridizing makes many of these plants quite variable, one quick way to get started in learning this group is to realize that they only have two different kinds of flowers, usually called florets . . . ray, or strap, florets and disc, or tubular, florets. In the case of the sunflowers and asters, both types of florets are present. In the chicory only strap florets are present, while burdock and thistle have only tubular, or disc, florets.

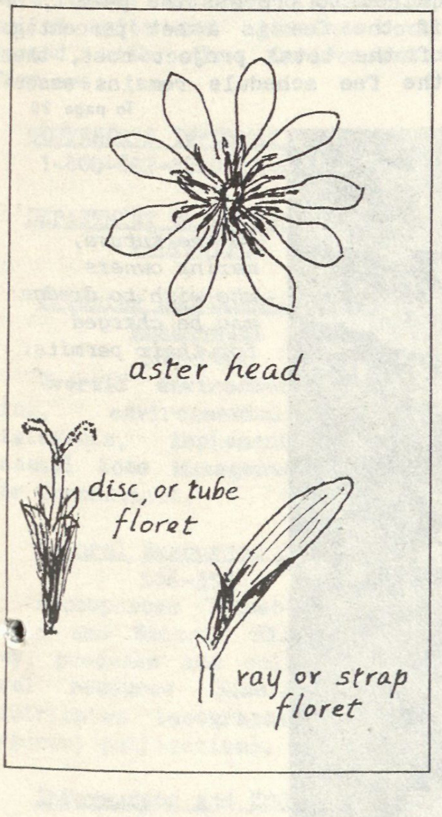
This article will deal specifically with asters. It is not difficult to learn many of the common types of asters by their size, the way the leaves clasp the stem, whether the stem is hairy or smooth, and how branched it is. Some are branched much more than others. You may also need to look at small details, such as the appearance of the bracts, or modified leaves, which are positioned below the flowers. Color in the same species may be quite variable, from white to blue to rose or purple, although some asters, particularly some of the whites, have color which is quite constant. Habitat is also helpful in identification. Many species of asters are commonly found along roadsides, in clearings in the woods, and along the edges of forests.

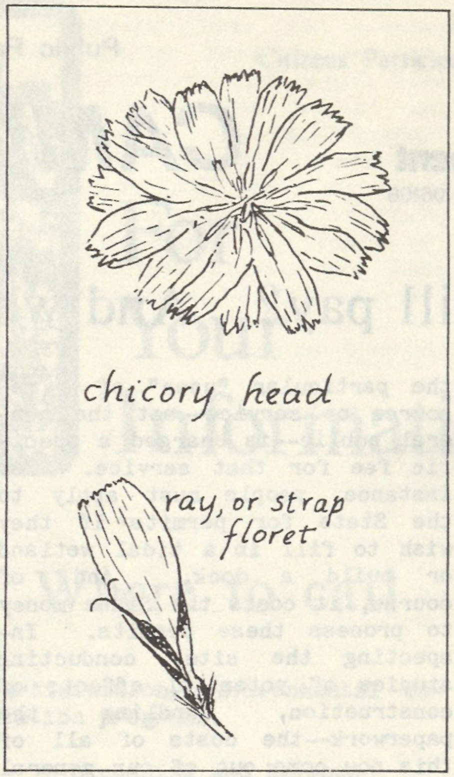
Asters never have yellow ray flowers, but, like goldenrods, begin to bloom at the tip of the branches. The heads nearest the central stem bloom last. Asters are very sensitive and wilt soon after they are collected. The ray flowers are often just female (pistillate). They develop a type of fruit known as an achene, which is small, dry, hard, and one-seeded. The achene has a ring of pappus, or modified hairs, and this helps the wind to disperse it. The disc flowers are typically male and female. These are generally yellow, but in some species they are reddish or purplish, particularly as they age.

The word "aster" comes from the Latin and Greek word for star. The remains of the flower can be identified by this characteristic even in the winter. There is a Greek legend that the aster was created from stardust. Wreaths of asters were considered sacred to all the gods and were put in temples on festive occasions.

A few of the common asters found in this area include the following: the New England aster, the smooth aster, the purple-stemmed aster, the stiff aster, the heart-leaved aster, the whorled wood aster, and the heath aster, all of which I will describe below.

The handsome, showy New England aster (Aster novae-angliae) is our most attractive wild aster. It is an ancestor of many of our hardy cultivated types. This species is usually bright purple, but it may occur in other colors. I have found it growing along roadsides, but it may grow in abandoned fields and wet swampy areas. Look with a hand lens at glands on the bracts and stalks on the flower heads. The leaves are crowded and toothless and clasp a hairy stem.



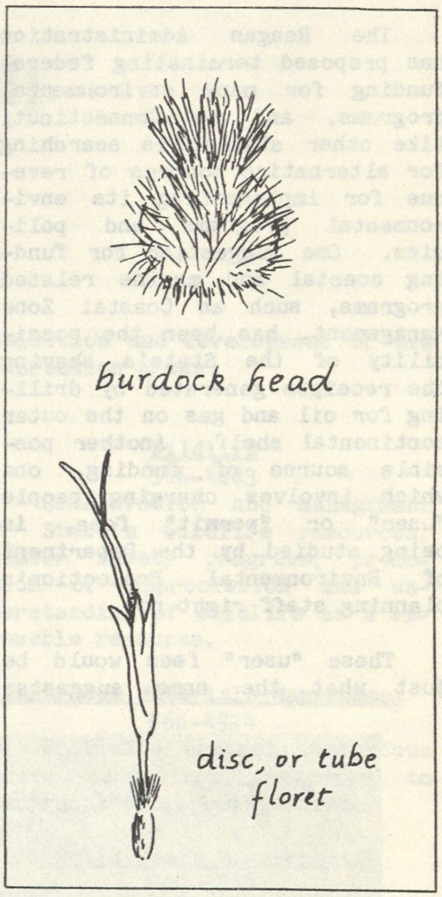


The smooth aster (Aster laevis) is another handsome aster. It is found along roadsides and in open fields. The leaves clasp the stem and are smooth and soft to the touch. It is purple to blue in color. The stem may have a whitish bloom.

The purple-stemmed aster (Aster puniceus) is another aster that has leaves that clasp the stem. It typically has a stem which is stout, reddish, and hairy but is quite variable. The stem may be green and hairless, and the leaves, which are usually toothed, may be toothless. It seems to prefer a moist environment. I have seen it growing along a highway adjoining a wetland area.

The stiff aster (Aster linariifolius) is easily recognized by its numerous one-nerved needle-like leaves which feel much like sandpaper to the touch. The rays are light blue-violet. I have been fooled at a distance by this species because of the variation in its height, which may range from six to 20 inches. It is usually found in dry areas along roadsides and in spots where ledges occur.

The heart-leaved aster (Aster cordifolius) is one of a number of types of asters with heart-shaped leaves. The ray flowers of this species are quite short (less than one-half inch). The flowers are usually pale blue-violet or white and occur in dense clusters. The disc is often red. The flower bracts are smooth, narrow, and blunt, with dark green tips. This is a common aster of woods and clearings. It varies in height from one to four feet.



Observe the leaves of the whorled wood aster (Aster acuminatus) carefully. They are often scattered up the stem in such a way that they appear whorled, that is, in an arrangement of leaves in a circle around a stem all at the same level. The upper leaves are larger than the lower leaves. The flower is usually white or purple-tinged. The stem is downy and often zig-zag and may be reddish at the base. It is found in moist or dry woods.

The heath aster (Aster ericoides) is one of a group of small white, narrow-leaved asters that are difficult to identify. It is quite variable. Look at the flower

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coastal area management
71 capitol avenue hartford conn. 06106

By Diane Giampa,
Public Participation Coordinator

CAM NEWS

Who will pay? And what fee?

The Reagan Administration has proposed terminating federal funding for many environmental programs, and so Connecticut, like other states, is searching for alternative sources of revenue for implementing its environmental programs and policies. One suggestion for funding coastal and marine related programs, such as Coastal Zone Management, has been the possibility of the State's sharing the receipts generated by drilling for oil and gas on the outer continental shelf. Another possible source of funding, one which involves charging people "user" or "permit" fees, is being studied by the Department of Environmental Protection's planning staff right now.

These "user" fees would be just what the name suggests: the particular "user" of a resource or service--not the general public--is charged a specific fee for that service. For instance, people must apply to the State for permits if they wish to fill in a tidal wetland or build a dock. And, of course, it costs the State money to process these permits. Inspecting the site, conducting studies of potential effects of construction, handling the paperwork--the costs of all of this now come out of our general tax revenues. Once the State begins to charge permit/user fees for certain activities, part of the expense will be shifted from the general public to the specific recipient of the permit or service.

During this past legislative session, the Connecticut General Assembly gave DEP Commissioner Stanley Pac the legal authority to levy certain permit/user fees. Sections of Public Act 82-91 empower the Commissioner of Environmental Protection to charge fees for granting permits for activities like removing sand and gravel below mean high water, constructing dams or reservoirs, and discharging wastes--as well as building or filling in the coastal zone.

Setting price schedules for various kinds of permit activities raises some provocative issues, however. If the fee for a permit is set strictly to recover administrative costs such as equipment and staff time required to process the permit, or if the fee is a set percentage of the total project cost, then the fee schedule remains essen-

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Jason Jacobson

In the future, marina owners who wish to dredge may be charged for their permits.

For Your Information

By Leslie Bieber,
Citizens' Participation Coordinator

Where to call

It sometimes seems like all you ever get when you call a government agency is a run-around. Being transferred five times or put on hold for 10 minutes is annoying, especially if you are calling long distance. In order to help you get the department you want to talk to the first time around, I have listed the most frequently called units and agencies concerned with the environment. They are:

GOVERNOR'S INFORMATION LINE

1-800-842-2220 (toll free)

DEPARTMENT OF ENVIRONMENTAL PROTECTION

Planning and Coastal Area Management

566-7404

Overall environmental planning, environmental impact statements, implementation of Coastal Zone Management Program for Connecticut.

Natural Resources Center

566-3540

Encompasses Connecticut Geologic and Natural History Survey, produces and collates natural resource baseline data, distributes topographical maps, reports, publications.

Information and Education

566-5599

General information, public participation, environmental education programs.

Licensing and Revenue

566-4409

Commercial fishing licenses, deer permits, lobster permits, other sportsmen's licenses.

Forestry

566-5348

Forest management on State-owned lands and service forestry program, cordwood cutting program, forest seedling programs, forest fire prevention program.

Fisheries

566-2287

Trout rearing and stocking program, technical assistance to the public, anadromous fish restoration, commercial fisheries catch and effort monitoring, public fishing access development, fisheries research.

Law Enforcement

566-3978

Enforcement of fish and game laws including marine fin fish and crustaceans, enforcement of laws and regulations concerning boats under 65 feet, regulation of commercial fishing in inland and marine waters, maintenance of order on all DEP properties.

Parks and Recreation

566-2304

Administration of State lands for outdoor recreation, selection and development of new recreation areas.

Wildlife

566-4683

Conservation and management of State's wildlife resources, hunter safety programs, promotion of appreciation and understanding of wildlife as a renewable resource.

Hazardous Materials Management

566-4924

Pesticide control, hazardous waste management, response to hazardous spill emergencies.

Solid Waste Management

566-5847

Oversight of all facets of solid waste management including landfill permits, inspections, and enforcement of regulations.

Water Compliance

566-3245

Implementation and enforcement of Clean Water Act and related State statutes, development of water quality standards, issuance of discharge permits, enforcement of water pollution standards, remediation of water pollution problems, grants for municipal waste water treatment facility construction.

Air Compliance

566-4030

Implementation and enforcement of Clean Air Act and State

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Pheasants

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demand for game far exceeded the numbers of pheasants available, and wildlife biologists agreed that the results obtained from previous stocking methods, aimed at fostering natural production, would not provide the numbers of cock pheasants needed to satisfy the increased demand.

In 1949, a law was passed that allowed sportsmen to harvest hen pheasants. This marked a major change in the State's pheasant programs. Increasing recreational opportunity for growing numbers of Connecticut sportsmen now became the primary concern of State stocking efforts. Adult pheasant liberation nearly doubled during the hunting season following the passage of the new law, with the sexes being liberated in equal numbers. Spring breeder and post season releases, which had failed to produce desired results, were discontinued. Cooperative program stocking concentrated on liberations as close to the hunting season as possible. That year, 36,488 pheasants were purchased at a cost of $2.43 per bird.

Connecticut's pheasant program today has in effect become a "put and take" operation designed to provide maximum recreational opportunities to the greatest number of sportsmen.

Each year, the DEP receives an appropriation from the General Fund estimated to be equal to the license fees paid by the State's pheasant hunters. This money is deposited to an annual gamebird purchase account. Twenty-week-old pheasants are obtained through competitive bids and contracts with commercial game farms within the State. Pheasant prices have been increasing steadily, and birds will be purchased this year at an average of $5.70 apiece. A total of 30,750 adult pheasants in equal sex ratios are scheduled to be released prior to and during the upcoming season. Limited monies from the account will also be used to provide gamebirds as the State's share for cooperative field trials.

Statewide pheasant distributions are made during seven one-week stocking periods which will begin this season on October 10 and end just prior to Thanksgiving Day. To benefit the greatest number of hunters, high use areas are stocked at least twice during each period. The number of pheasants liberated per period varies, with approximately 30 percent of the total available for opening day pheasant hunters.

Pheasants are picked up at the game farms by Conservation Officers, biologists, and other DEP personnel and are released in suitable habitat on wildlife management areas, various State-owned or leased parcels, as well as on 25 designated permit-required hunting areas. State-controlled areas receive the greatest numbers of birds, and other lands open to public hunting are stocked depending upon habitat and their distribution within an area.

Stocking personnel are provided with prepared schedules which indicate breeder source, release period, and number of birds to be liberated on specific areas. In developing schedules, consideration is given to hunter use and habitat availability in order to distribute hunting pressure and minimize potential conflicts caused by high hunter densities. To promote maximum returns and recreational benefits, stocking schedules are designed to achieve equitable distributions on a statewide basis.

Pheasant stocking as it exists today has a long history. Although additional changes may be necessary in the future, pheasant hunting as a form of outdoor recreation will undoubtedly continue to capture the interest of many. ■

Asters

From page 17

bracts in order to identify this species. It has green bracts which are broad and outcurving, with sharp tips. The flowers may be densely crowded to give a plume-like shape such as that found in certain types of goldenrods. It is found along roadsides in open dry places.

Asters have been found to be useful in a number of ways. The leaves of some asters can be used as an herb, like spinach, if prepared when they are young and fresh. While a few species are poisonous, some provide good grazing for larger wild game animals and domestic animals such as horses and sheep. They also provide cover for many small wild game animals. All provide stability in holding the soil and add beauty to their surroundings. ■

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User fees

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tially neutral on environmental policy. An alternative would be for the amount of the permit fee to be determined by the extent of a project's effect on nearby natural resources. This latter method, though certainly more difficult to set up, might create an incentive for developers to reduce the environmental impacts of their activities, since by doing so they could lower the cost of their permits as well.

How do Coastal Management Programs fit into all this? The DEP's planning staff is exploring the possibility of charging a fee for CAM staff time spent in researching and performing federal consistency certifications. When a federal agency such as the Army Corps of Engineers proposes a dredging project in Connecticut coastal waters, for example, coastal management people study the potential effects of the dredging to determine if the activity is "consistent" with established coastal goals and policies. If it is, the Corps may proceed with the dredging; if it is not, the activity is prohibited. What still must be determined, however, is under what circumstances a State agency may charge the federal government a fee.

The planning staff, with the assistance of staff members in the agency's various environmental quality programs, will be grappling with all of these issues over the next few months. Since the practice of coastal management consists largely of permit activities regulating the use of coastal resources, it may make particular sense to apply the new fee legislation to Connecticut's CAM Program as one way of stabilizing funding and assuring that sound coastal policies survive these times of federal cutbacks. ■

Guide to DEP

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Implementation Plan, issuance of industrial permits, monitoring of air quality, development of air quality standards.

Water Resources
566-7220
Water resource management (except water quality), beach and shore erosion control, flood control, regulation of inland and tidal wetlands, dam safety program, administration of flood insurance and flood plain protection programs.

Noise Control
566-7494
Enforcement of stationary source noise regulations, technical assistance to communities developing local noise control ordinances.

Radiation Compliance
566-5668
Responsibility for control of all sources of ionizing and microwave radiation.

DEPARTMENT OF HEALTH SERVICES

Toxic Hazards Section
566-8166

Environmental Health Services
566-2195

Drinking Water Section
566-3110
Public health matters related to the environment, water sampling, etc.

COUNCIL ON ENVIRONMENTAL QUALITY
566-3510
Connecticut's environmental "watchdog" agency.

CONNECTICUT AGRICULTURAL EXPERIMENT STATION (New Haven)
789-7214
Information on plants and insects, including gypsy moths. ■

Trees don't heal, they ???

From U.S.D.A. Forest Service

When a tree is injured, it doesn't heal.

Wait a minute, you say. What happens to all the injured trees? Certainly they don't die. Many old trees bear the scars of numerous run-ins with man and nature.

That's true, but still, trees don't heal. They compartmentalize instead.

Come now, you say, aren't you just playing with words?

Well, if you use heal to mean "get well and keep on living," yes. But if you use it in its true sense, to mean "repair or replace damaged parts," no. In that case, the difference between compartmentalizing and healing for the tree is the difference between living and dying.

You see, trees aren't physically able to heal, to repair the damage. That's partly because of their cellular structure. Cells in a tree are like tiny building blocks, each locked into place and interconnected with those around it. Injure one and the damage would spread like wildfire. If it weren't for compartmentalization.

"The Connecticut Department of Environmental Protection is an equal opportunity agency that provides services, facilities and employment opportunities without regard to race, color, religion, age, sex, physical handicap, national origin, ancestry, marital status or political beliefs."

Thanks to this process the tree can wall off injury and prevent it from spreading out of control. Mature trees have hundreds or even thousands of injured and infected areas closed off in discrete compartments.

Trees are more than 200 million years old, but the idea of compartmentalization is a product of the last 25 years of research. The whole concept of what a tree is has changed recently, and along with it the idea of how a tree grows, reacts to injury, and recovers or dies.

A tree is, in a sense, many plants growing one on top of the other in cone fashion. Each year some parts are shed, including leaves or needles, reproductive organs, and fine absorptive roots. The new tree grows over the old, woody frame.

If compartmentalization works so well, you might ask, why do some trees die? Many of the reasons can be summed up in one word: stress.

Take Dutch elm disease, for example. Scientists now know that trees only succumb when their energy supplies are so depleted that they can't compartmentalize effectively. The weakened tree is then easy prey.

The same is true of gypsy moth infested trees. The caterpillar itself doesn't kill. But it creates a strain on the tree's energy and weakens its natural defense system. Compartmentaization is the core of that system.

Once we know why trees die, we can better know how to treat them. The discovery of compartmentalization changed many of our ideas about tree care. We now know that wound dressings do not stop decay or aid healing. That the swollen collar at the base of a branch should not be injured or removed. That frost does not cause "frost cracks." And on and on.

Trees need their own brand of medicine, not one adapted

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Compartmentalizing

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from concepts of animal or human care. If we continue to try to "heal" trees, little progress will come. We should treat trees like trees. And realize that, for them, survival means compartmentalizing. ■

Start a State tree

Planting seeds of white oak

Connecticut's State tree, the white oak (Quercus alba) produces seeds yearly from flowers which blossom in the spring before or with the arrival of the leaves. The acorns fall in late August and should be collected right away because they germinate almost immediately. Sort them, discarding any with weevil holes, cracked seed coats, mold, etc. Sorting may be done by putting seeds into water and discarding any that float.

Moisture content is critical; seeds will die during storage or germination if it is allowed to drop below 30 to 50 percent.

Plant acorns directly in seed bed at a density of ten to 35 seeds per square foot. Mulch with leaves or straw over the winter and cover with hardware cloth (helps keep mulch in place and at the same time protects from birds and rodents). Partial shade is beneficial for good germination. Expect germination in ten to 41 days. In spring, after danger of frost, remove mulch. Plant out the following year. ■

Events

October 23, 10 a.m.-1 p.m.
Connecticut Audubon Center, 2325 Burr St., Fairfield (259-6305)
Open House and Tour of CAS Wildlife Rehabilitation Facilities for orphaned and injured animals. Free.

Friday, October 29, 8:30 p.m.-8 a.m., October 30
Overnight at the Mystic Marinelife Aquarium...for Adults Only! Adult members of the Aquarium get their turn to sleep overnight at the Aquarium. See whether Alex sleeps with his eyes open or closed! Observe the nocturnal behavior of dolphins, fishes, and invertebrates! Participate in a variety of special activities including a midnight dinner and a special eye-opening breakfast. Cost: $50. Call the membership office at 536-4200 for membership and reservation information.

November 12 & 13: 8 p.m., Friday, 9 a.m.-3 p.m., Saturday
"Managing a Small Woodlot," a workshop at the Connecticut Audubon Center, 2325 Burr St., Fairfield. $30; advance registration required (259-6305).

November 18
"Great American Smokeout," sponsored by the American Cancer Society.

Permits

Dams

5/11/82: New Haven Water Co.
To repair a dike on West Brook in Prospect. Conditions.

Encroachments

4/16/82: Lucien and Elaine Grenier, South Windsor
To place fill riverward of established stream channel encroachment lines for Trout Brook for construction of an addition to an existing home. Conditions.

4/23/82: Millbridge Associates, Greenwich
To excavate and place fill riverward of established stream channel encroachment lines for the Rippowam River and construct 190 ft. of retaining wall for an access drive and parking for a proposed condominium complex in Stamford. Conditions.

5/5/82: Knights of Columbus, East Hartford
To remove approximately 450 cubic yards of fill from inland wetlands and place on adjacent uplands within stream channel encroachment lines for the Connecticut River. Conditions.

5/6/82: Housing Site Development Agency, City of Stamford
To construct a wooden footbridge across the Rippowam River in Stamford within established stream channel encroachment lines. Conditions.

Tidal Wetlands/ Structures & Dredging

4/15/82: Connecticut Real Estate Sales, Milford
To place fill and riprap within tidal wetlands in Milford and in Milford Harbor off Edgewater Place for construction of a ramp and floating dock system. Conditions.

Structures & Dredging

3/26/82: Charles Farren, New Haven
To retain and maintain existing docks and construct additional floating docks in the Quinnipiac River at New Haven. Conditions.

4/1/82: City of Stamford Dept. of Parks & Natural Resources
To replace sand on beaches and remove sand build-ups. Conditions.

4/6/82: City of New Haven Dept. of Parks & Recreation
To regrade the beach at Lighthouse Point Park in New Haven. Conditions.

4/15/82: Vincent & Lucy SantaMaria, Stonington
To retain and maintain a bulkhead, a concrete and floating dock in Fishers Island Sound at Latimer Point, Stonington. Conditions.

4/15/82: Noank Shipyard, Inc., Noank
To construct and maintain a pile and timber pier extending 368 ft. beyond mean high water from the property on Pearl St. in Noank. Conditions.

4/21/82: Albin S. Anderson, West Hartford
To construct and maintain an L-shaped pile and timber pier extending 38 ft. into Venetian Harbor from seawall at Atlantic Ave. in Groton Long Point. Conditions.

4/22/82: Charles L. Bartlett, Branford
To dredge approximately 5,900 cubic yards of material from the Branford River for an existing

commercial marina in Branford. Conditions.

4/23/82: Susan Senie, Westport
To construct a dock extending 122 feet beyond mean high water into Saugatuck Harbor from an existing bulkhead in Westport. Conditions.

4/27/82: D.J. Carten Co., Bridgeport
To construct and maintain a marina in an existing basin off the Housatonic River in Milford. Conditions.

5/4/82: Michael F. Murphy, Greenwich
To place and maintain a dock in the Byram River at Greenwich. Conditions.

5/4/82: Philip M. Punzelt, Jr., Westport
To dredge and place structures in the Saugatuck River off Riverside Ave. in Westport. Conditions.

5/7/82: Thimble Island Electric Cooperative, Inc., New Haven
To install and maintain approximately 20,000 feet of underwater electrical distribution cable to feed residences on the Thimble Islands in Long Island Sound near Stoney Creek. Conditions.

5/7/82: City Point Development Co., New Haven
To construct and maintain a 58,000 sq. ft. pile-supported platform off South Water St. in New Haven Harbor. Conditions.

5/7/82: Northeast Nuclear Energy Co., Hartford
To place 40,000 cubic yards of cured concrete waste and 100,000 cubic yards of excavated stone into the old quarry at Millstone Nuclear Power Station in Niantic Bay and Long Island Sound. Conditions.

5/7/82: Trizec Stamford-Goldfeld Co., Stamford
To construct 2 storm water headwalls, one south of S. State St. on the Mill River and one south of Richmond Hill Ave. on the Mill River in Stamford. Conditions.

Water Compliance

5/27/82: Dresser Industries, Inc., Stratford
To discharge treated metal finishing wastewaters to the Housatonic River in an average daily flow of 75,000 gallons per day. Conditions.

6/10/82: Clairol, Stamford
To discharge pretreated wastewaters from personal care product manufacturing to the City of Stamford Sewerage System in an average daily flow of 30,000 gallons per day. Conditions.

6/10/82: Phelps Dodge, Cooper Products Company, New York
To discharge treated metal finishing wastewater and non-contact cooling water to the Yantic River in an average daily flow of 37,500 gallons per day. Conditions.

6/10/82: Multi-Circuits, Inc., Manchester
To discharge treated wastewaters from printed circuit metal finishing operations and alkaline stripping wastewaters to the Town of Manchester Sanitary Sewerage System. Conditions.

6/10/82: Thermos Division, King Seeley Thermos Company, Norwich
To discharge non-contact cooling water to the Thames River in an average daily flow of 3,200 gallons per day. Conditions.

6/10/82: Long Hill Farm, Ltd., Guilford
To discharge 4,800 gallons per day of domestic sewage to groundwaters in the watershed of the West River. Conditions.

6/10/82: Sealectro Corporation, Watertown
To discharge pretreated metal finishing wastewaters to the Town of Watertown Sewerage System in an average daily flow of 4,800 gallons per day. Conditions.

6/10/82: Glass Container Corporation, Indianapolis
To discharge glass house wastewaters to the Town of Killingly Sewerage System in an average daily flow of 15,000 gallons per day. Conditions.

6/10/82: Britain's Automotive, Inc., Branford
To discharge 50 gallons per day of floor and carwash water to the Branford sanitary sewer system. Conditions.

6/11/82: Bell Harbor Refining, West Haven
To discharge wastewater from an oily waste treatment facility to the city of West Haven Sewerage System in an average daily flow of 20,000 gallons per day. Conditions.

6/22/82: The Southern Connecticut Gas Company, Bridgeport
To discharge 108 gallons per minute of non-contact cooling water to the Mill River. Conditions.

6/22/82: Richardson-Vicks, Inc., Shelton
To discharge 4425 gallons per day of laboratory washwater, cooling tower and boiler blowdown wastewaters to the City of Shelton Sewerage System. Conditions.

6/22/82: Devcon Enterprises, West Hartford
To discharge domestic sewage to the Town of Groton Sewerage System in an average daily flow of 33,700 gallons per day. Conditions.

6/22/82: Beaver Brook Circuits, Inc., Bethel
To discharge treated printed circuit wastewater to the Town of Bethel Sewerage System in an average daily flow of 15,000 gallons per day. Conditions.

6/22/82: National Railroad Passenger Corporation, Washington, D.C.
To discharge pretreated oily wastewaters to the City of New Haven Sewerage System in an average daily flow of 72,000 gallons per day. Conditions.

6/22/82: The Torrington Company, Torrington
To discharge treated wire cleaning and metal finishing wastewaters to the City of Torrington Sewerage System in an average daily flow of 60,000 gallons per day. Conditions.

6/22/82: The Torrington Company, Torrington
To discharge treated metal finishing wastewater to the City of Torrington Sewerage System in an average daily flow of 80,000 gallons per day. Conditions.

New CCC starts work

Sixty-four young adults will soon be at work as part of the newly created Connecticut Conservation Corps (CCC). Governor William A. O'Neill announced the creation of the new CCC in mid-August, and DEP's Planning and Development Unit began accepting applications at that time.

Some participants in the new CCC were expected to begin working as early as September 15, according to Richard Couch, Director of Planning and Development for DEP's Division of Conservation and Preservation. The corps is designed to employ unemployed young adults on needed projects at the State's parks, forests, fish hatcheries, and wildlife management areas.

The new CCC provides a modest replacement for the federally funded Youth Conservation Corps and the Young Adult Conservation Corps, both of which were discontinued earlier this year.

"The federal programs were exceptionally cost effective," Governor O'Neill said in his announcemeent of the new program, "returning over $1.50 in the value of work accomplished for every dollar expended." He added, "The Department of Environmental Protection has made a commitment to maximize the use of funds so that virtually all of the available dollars will be channeled to CCC enrolleee salaries and project materials. The DEP will absorb all administrative overhead."

For fiscal 1983, the Connecticut Conservation Corps is funded at $525,000. The money will come from increased parking and license fees instituted by the DEP this year.

Permanent residents of Connecticut who are at least 18 years of age but not older than 25 and currently unemployed are eligible for enrollment in the CCC. Enrollees will be paid the State minimum wage of $3.37 per hour for a 40 hour work week. The CCC will offer a maximum of one year's employment with possible time extensions for excellent performance. The aim of this program is to provide initial or interim employment for young people that will lead to permanent, unsubsidized employment.

Eight positions are expected to be filled at each of the following locations: Burr Pond State Park, Torrington; DEP's Farmington Headquarters; Southford Falls State Park in Southbury; Sherwood Island State Park in Westport; Fort Shantok State Park in Montville; DEP's Marlborough Headquarters; Hammonasset Beach State Park in Madison; and Rocky Neck State Park in East Lyme.

In his announcement Governor O'Neill said that he was particularly proud that Connecticut had exercised the initiative and found the funding to take what he termed a major step in improving and maintaining Connecticut's recreational programs while also increasing job opportunities for the State's young people. "A great deal of credit must be given to everyone in the General Assembly and in the Executive branch who participated in making the Connecticut Conservation Corps a reality." ■

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State of Connecticut
Department of Environmental Protection
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